

energizing the ions to form a stream from the plasma in the plasma chamber straight toward the substrate in the deposition chamber so that carbon from the ions is deposited over the magnetic layer [on the substrate], wherein the ions impact with an energy which promotes formation of sp^3 carbon-carbon bonds, and wherein the impacting ions have a substantially uniform weight.

2. (As Filed) A method as claimed in claim 1, further comprising selectively energizing the stream with a predetermined impact energy.

3. (As Filed) A method as claimed in claim 1, wherein the stream impacting the substrate is primarily composed of ions having a uniform weight.

4. (As Filed) A method as claimed in claim 1, wherein the impact energy of the ions is substantially uniform.

Please cancel claims 5-7.

8. (Amended) A method for producing magnetic recording media, the method comprising:
forming a magnetic layer over a substrate;
ionizing a source material by [A method as claimed in claim 1, wherein the ionizing step comprises] interelectrode vaporization of the source material, the source material comprising a solid carbon cathode, wherein the carbon cathode is heated sufficiently to produce an arc that is distributed over the cathode so as to inhibit ejection of macroparticles while forming a plasma containing ions which comprise carbon; and
energizing the ions to form a stream from the cathode straight toward the substrate so that carbon from the ions is deposited over the magnetic layer, wherein the ions impact with an energy which promotes formation of sp^3 carbon-carbon bonds.

9. (As Filed) A method as claimed in claim 8, wherein the energizing step comprises electrostatically biasing the ions toward the substrate.

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a3 1 ~~15~~ (Amended) A method as claimed in claim ~~8~~ ¹³ [1],
2 wherein the energizing step comprises selectively accelerating
3 the ions toward the substrate to provide the impact energy.

NE 1 { 11. (As Filed) A method as claimed in claim 10, wherein the
2 selectively energizing step comprises varying the potential of a cathodic arc
3 source.

a4 1 ~~17~~ (Amended) A method for producing magnetic
2 recording media, the method comprising:
3 forming a magnetic layer over a substrate;
4 ionizing a source material so as to form a plasma
5 containing ions which comprise carbon; and
6 energizing the ions to form a quasi-neutral stream from
7 the plasma toward the substrate by [A method as claimed in claim
8 1,] applying an alternating potential between a coupling
9 electrode and an extraction grid having a smaller surface area
10 than the coupling electrode so that the plasma is self-biasing
11 relative to the extraction grid, wherein the ions are energized
12 so that carbon from the ions is deposited over the magnetic
13 layer, and wherein the ions impact with an energy which promotes
14 formation of sp³ carbon-carbon bonds.

1 ~~18~~ (Amended) A method for producing magnetic
2 recording media, the method comprising:
3 forming a magnetic layer over a substrate;
4 ionizing a source material so as to form a plasma
5 containing ions which comprise carbon, [A method as claimed in
6 claim 1,] wherein the source material comprises a gas having a
7 substantially coherent dissociation energy spectra; and
8 energizing the ions to form a stream from the plasma
9 toward the substrate so that carbon from the ions is deposited
10 over the magnetic layer, wherein the ions impact with an energy
11 which promotes formation of sp³ carbon-carbon bonds.

NE 1 { 14. (As Filed) A method as claimed in claim 13, wherein the
2 source material comprises acetylene.

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1 15. (As Filed) A method as claimed in claim 1, wherein the
2 impact energy is between about 57 and 130 eV for each carbon atom.

1 16. (As Filed) A method as claimed in claim 15, wherein the
2 impact energy is between about 100 and 120 eV for each carbon atom.

Please cancel claims 17-37.

Please add claims 38-48 as follows:

1 ~~38. A method as claimed in claim 1, wherein the~~
2 ~~energizing step is performed using capacitative coupling by~~
3 ~~applying a capacitative alternating potential between a coupling~~
4 ~~electrode adjacent a first end of the plasma chamber and an~~
5 ~~extraction electrode adjacent a second end of the plasma chamber,~~
6 ~~the first and second ends defining an axis therebetween, the~~
7 ~~extraction electrode having a smaller surface area than the~~
8 ~~coupling electrode so that the plasma is self-biasing relative to~~
9 ~~the extraction electrode.~~

AS {
1 ~~39. A method as claimed in claim 38, wherein the~~
2 ~~extraction electrode is disposed between the plasma and the~~
3 ~~deposition chamber, the stream passing axially through the~~
4 ~~extraction electrode.~~

1 ~~40. A method as claimed in claim 39, wherein the~~
2 ~~energizing step is performed using inductive coupling by applying~~
3 ~~an inductive alternating potential to an antenna disposed~~
4 ~~circumferentially around the plasma chamber.~~

1 ~~41. A method as claimed in claim 40, further~~
2 ~~comprising densifying the plasma by applying a magnetic field~~
3 ~~within the plasma chamber.~~

1 ~~42. A method as claimed in claim 41, further~~
2 ~~comprising homogenizing the plasma by moving the magnetic field~~
3 ~~within the plasma chamber.~~

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~~43~~. A method as claimed in claim ~~42~~, wherein the
magnetic field is rotated about the axis within the plasma
chamber by selectively energizing coils arranged radially about
the plasma chamber.

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~~44~~. A method as claimed in claim ~~43~~, wherein the
magnetic field rotates with a frequency which is much less than a
frequency of the capacitative potential and much less than a
frequency of the inductive potential.

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~~45~~. A method for producing magnetic recording media,
the method comprising:
supporting a substrate in a deposition chamber;
inductively ionizing a source material in a plasma
chamber with an antenna disposed circumferentially about the
plasma chamber so as to maintain a plasma in the plasma chamber,
the plasma containing ions which comprise carbon;
capacitively energizing the ions by applying an
alternating potential between a coupling electrode adjacent one
end of the plasma chamber and an extraction electrode adjacent
another end of the plasma chamber so as to form a stream of ions
through the extraction electrode, the stream passing from the
plasma chamber to the substrate in the deposition chamber,
wherein the ions impact with an energy which promotes formation
of sp^3 carbon-carbon bonds.

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~~46~~. A method as claimed in claim ~~45~~, further
comprising:
densifying the plasma in the plasma chamber by
directing a magnetic field into the plasma chamber.

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~~47~~. A method as claimed in claim ~~46~~, further
comprising rotating the magnetic field laterally through the
plasma chamber.

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~~48~~. A method as claimed in claim ~~45~~, wherein the
source material comprises acetylene.--